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Polyphenolic compounds from *Fucus vesiculosus* and their antioxidant activity

D.B. Hermund[1*], M. Plaza[2], C. Turner[2], R. Jónsdóttir[3], H.G. Kristinsson[3], C. Jacobsen[1] K.F. Nielsen[4]

[1]Division of Food Technology, Research Group for Bioactives – Analysis and Application, National Food Institute, Technical University of Denmark, Søltofts Plads, Building 221, DK-2800 Kgs, Lyngby, Denmark. E-mail: [*]dbala@food.dtu.dk

[2]Centre for Analysis and Synthesis, Department of Chemistry, Lund University, SE 22100 Lund, Sweden

[3]Matís, Vínlandsleid 12, IS-113 Reykjavík, Iceland

[4]Department of Systems Biology, Metabolomics Platform, Technical University of Denmark, Søltofts Plads, Building 221, DK-2800 Kgs, Lyngby, Denmark

Natural antioxidants derived from marine algae have the potential for improving oxidative stability of lipids in food systems. Recent studies showed that extracts from Icelandic brown algae *Fucus vesiculosus* reduced lipid oxidation in fish-oil-enriched foods, such as milk, mayonnaise and granola bars. Hence, these increased the lag phase in development of unwanted flavours and odours related to lipid oxidation. The possible contributors to a high antioxidant activity of these extracts were found mainly to be due to high content of phenolic compounds but also a high carotenoid content (fucoxanthin and astaxanthin) and a low content of prooxidant transition metals. Previously, a high *in vitro* radical scavenging activity of *F. vesiculosus* has been related to a high phenolic content. Since *F. vesiculosus* are rich in phlorotannins, the major group of polyphenolic compounds in brown algae, it is hypothesised that the *in vitro* radical scavenging activity of *F. vesiculosus* extracts is related to the phlorotannin content. However, the clarification of how the different phlorotannins contributed to the overall antioxidant activity is lacking.

An 80% (v/v) aqueous ethanol extract (EE) was obtained and further the phlorotannins were purified by ethyl acetate partitioning to obtain solvent fraction EAF. The total phenolic content of both EE and EAF was determined and the *in vitro* antioxidant properties were evaluated. Furthermore, separation and characterization of phlorotannins from EAF with respect to composition and antioxidant activity were determined with applied on-line analysis technique. This was done using high performance liquid chromatography coupled to an on-line electro chemical detector and the compounds were characterised by mass spectrometry (HPLC-DAD-ECD-QTOFMS^n).

Phlorotannin compounds were identified according to the fragmentation pattern and their antioxidant contribution was evaluated. The results from this work will be presented.